



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/804,254	03/19/2004	Bradley O. Stimson	1946C2/AGS/IBSS/LP	7487
44182	7590	04/12/2006		
PATTERSON & SHERIDAN, LLP APPLIED MATERIALS INC 595 SHREWSBURY AVE SUITE 100 SHREWSBURY, NJ 07702			EXAMINER MCDONALD, RODNEY GLENN	
			ART UNIT 1753	PAPER NUMBER

DATE MAILED: 04/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/804,254

Applicant(s)

STIMSON ET AL.

Examiner

Rodney G. McDonald

Art Unit

1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |  |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>6-30-04</u> | 6) <input type="checkbox"/> Other: ____  |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

Claims 6 and 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 6, line 5, is indefinite because the phrase "a diameter less a diameter" is unclear. It is suggested to write this as "a diameter less than a diameter".

Claim 20, line 12, is indefinite because the phrase "a waste comprising" is unclear. It is suggested to write this as "a waste ring comprising".

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3 and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by Tepman et al. (EP 0 776 990).

Regarding claim 1, Tepman et al. teach a process kit comprising a cylindrical outer flange 23 having a first end; a body (See Fig. 1) extending radially inward from the first end of the cylindrical outer flange 23; a cylindrical inner flange 22 which extends downward from a lower surface of the body (See Fig. 1); an inner ring 25 disposed inward of the body and having a common upper surface therewith (See Fig. 1). A bridge couples the inner ring to the body wherein the cylindrical inner flange 22, the

cylindrical outer flange 23, the inner ring 25, the bridge and the body form a single piece cover ring. (See Fig. 1; Column 3 lines 27-45)

Regarding claim 3, the cylindrical outer flange 23 extends farther from the body relative to the cylindrical inner flange 22. (See Fig. 1; Column 3 lines 27-45)

Regarding claim 4, the cylindrical inner flange is tapered. (Column 3 lines 30-32)

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 2 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tepman et al. (EP 0 776 990) in view of Steger et al. (U.S. Pat. 5,494,523).

Tepman et al. is discussed above and all is as applies above. (See Tepman et al. discussed above)

The difference between Tepman et al. and the present claim is that the cylindrical outer flange being fabricated from a ceramic material (Claims 2 and 18).

Regarding claim 2, Steger teach that the cover ring can be made of ceramic material. (Column 5 lines 47-64)

The motivation for constructing the cover ring including the cylindrical outer flange of ceramic is that it allows for mitigating the upward distortion of the plasma sheath boundary at the edge of the wafer. (Column 5 lines 47-64)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Tepman et al. by utilizing a cover ring including the cylindrical outer flange made of ceramic as taught by Steger et al. because it allows for mitigating the upward distortion of the plasma sheath boundary at the edge of the wafer.

Claims 1 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tepman et al. (EP 0 776 990) in view of Davenport et al. (EP 0 628 989).

Tepman et al. is discussed above and all is as applies above. (See Tepman et al. discussed above)

The difference not yet discussed is where the inner ring, bridge, and body define a notch formed there between extending into the body and the lower surface. (Claim 5)

Regarding claim 5, Davenport et al. teach including a notch in the cover ring to cooperate with a waste ring 112. (See Fig. 1)

The motivation for utilizing a notch is that it allows cooperation with the waste ring. (See Fig. 1)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Tepman et al. by utilizing a notch in the cover ring as taught by Davenport et al. because it allows cooperation with the waste ring.

Claims 1, 6, 7, 10-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tepman et al. (EP 0 776 990) in view of Cathey et al. (U.S. Pat. 4,859,304).

Tepman et al. is discussed above and all is as applies above. (See Tepman et al. discussed above) Tepman et al. further teach a waste ring 508 shown in Fig. 5. (See Fig. 5)

Regarding claim 11, Tepman et al. teach a pedestal cover 504 having a stepped outer diameter adapted to interface with a portion of the waste ring 508. (See Fig. 5)

Regarding claim 12, Tepman et al. teach recesses adapted to accept fasteners to couple the pedestal cover to the substrate support. (Column 4 lines 7-18) Whether utilizing three or four screws is obvious since the more screws utilized the more secure.

Regarding claim 13, the pedestal cover can be made from stainless steel. (Column 9 lines 3-6)

Regarding claims 14, 15, the pedestal can have a plurality of apertures proximate the stepped edge. (See Fig. 5) The apertures hold pins (i.e. buttons), which support the substrate just above the surface. (Column 5 lines 11-15)

The differences between Tepman et al. and the present claims is that a waste ring having an annular lower ring body, the lower ring body comprising an upper surface adapted to support the body of the cover ring; a lower surface adapted to mount to a

Art Unit: 1753

substrate support; and an outer surface having a diameter less than a diameter of the cylindrical inner flange (Claim 6), the upper ring body having a lower surface coupled to the upper surface of the lower ring body, wherein at least a portion of the upper ring body extends radially inward of the lower ring body (Claim 7), and the indexing tab is not discussed (Claim 10).

Regarding claims 6 and 7, Tepman et al. teach in Fig. 5 a waste ring 508 supporting the cover ring. (See Tepman et al. Fig. 5) Cathey et al. teach a ceramic waste ring in Fig. 3 that has a lower ring body having an upper surface which can support the body of the cover ring as demonstrated in Tepman et al. Fig. 5 and a lower surface adapted to mount to a substrate support and an outer surface having a diameter less than a diameter of the cylindrical inner flange. Cathey et al. further show an upper ring body having a lower surface coupled to the upper surface of the lower ring body, wherein at least a portion of the upper ring body extends radially inward of the lower ring body. (See Fig. 3)

Regarding claim 10, the waste ring 43 has an indexing tab that allows the waste ring to orient to a mating part. (See Fig. 3)

The motivation for utilizing a waste ring is that it allows for reducing the effects of polymer deposition increasing the time between service intervals. (Column 2 lines 8-10)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Tepman et al. by utilizing a waste ring as taught by Cathey et al. because it allows for increasing the time between service intervals.

Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tepman et al. in view of Cathey et al. as applied to claims 1, 6, 7, 10-15 above, and further in view of Hower et al. (U.S. Pat. 5,700,725).

The differences not yet discussed are each rest button comprising a hollow tube and an annular flange extending radially outward from the tube (Claim 16) and the rest buttons being fabricated of ceramic material (Claim 17).

Regarding claim 16, Hower et al. teach three protrusions extending from the wafer support susceptor to decouple the wafer from the susceptor during plasma processing. The protrusions can be hollow tubes with an annular flange. (See Abstract; Figures 2, 4, 5, 6)

Regarding claim 17, the supports can be ceramic. (Column 3 lines 17-19)

The motivation for utilizing ceramic buttons is that it allows for decoupling the wafer from the susceptor. (See Abstract)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized ceramic rest buttons comprising a hollow tube and an annular flange as taught by Hower et al. because it allows for decoupling the wafer from the susceptor.

Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tepman et al. in view of Cathey et al. as applied to claims 1, 6, 7, 10-15 above, and further in view of Drage (U.S. Pat. 4,793,975).

The differences not yet is where the waste ring further comprises a ridge extending upward from an upper surface of the upper ring body (Claim 8), the ridge



comprising a radially inward facing surface configured to bound an outer edge of a substrate supported by the substrate support (Claim 9) and wherein a portion of the upper surface of the upper ring body is configured to extend to below a surface of the substrate (Claim 9).

Regarding claim 8, Drage teach in Fig. 3 waste ring comprising a ceramic insert 51 having a ridge extending upward from the upper surface. (See Fig. 3; Column 3 lines 37-51; Column 4 lines 32-36)

Regarding claim 9, Drage teach that the ridge has a radially inward facing surface configured to bound an outer edge of a substrate supported by the substrate support. (See Fig. 3; Column 3 lines 37-51)

Regarding claim 9, Drage show a portion of the upper surface of the ring body extending below a surface of the substrate. (See Fig. 3)

The motivation for utilizing a waste ring with a ridge and extending under the substrate is that it allows for better control of the plasma. (Column 4 lines 33-36)

Therefore, it would have been obvious to one of ordinary skill in the art to have configured the waste ring to have a ridge and extend under the substrate as taught by Drage because it allows for better controlling the plasma.

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tepman et al. in view of Steger et al. as applied to claims 1, 2, and 18 above, and further in view of Cathey et al. (U.S. Pat. 4,859,304) and Hower et al. (U.S. Pat. 5,700,725).

The differences not yet discussed are the waste ring and the ceramic rest buttons.

Regarding the waste ring, Cathey et al. is discussed above and teach the ceramic waste ring. (See Cathey et al. discussed above)

The motivation for utilizing a waste ring is that it allows for reducing the effects of polymer deposition increasing the time between service intervals. (See Cathey et al. discussed above)

Regarding the ceramic rest buttons, Hower et al. is discussed above and teach the ceramic rest buttons. (See Hower et al. discussed above)

The motivation for utilizing ceramic rest buttons is that it allows decoupling of the wafer from the susceptor. (See Hower et al. discussed above)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized a waste ring as taught by Cathey et al. and to have utilized ceramic rest buttons as taught by Hower et al. because it allows for reducing the effects of polymer deposition and for decoupling the wafer from the susceptor.

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tepman et al. (EP 0 776 990) in view of Steger et al. (U.S. Pat. 5,494,523), Cathey et al. (U.S. Pat. 4,859,304), Drage (U.S. Pat. 4,793,975) and Hower et al. (U.S. Pat. 5,700,725).

Tepman et al. is discussed above and all is as applies above. Tepman et al. teaches a cover ring, a waste ring, stainless steel pedestal cover, and rest buttons. (See Tepman et al. discussed above)

The differences between Tepman et al. and the present claims is that the cover ring being ceramic is not discussed, the features of the waste ring are not discussed,

the ridge of the waste ring is not discussed, and the features of the rest buttons are not discussed.

Steger et al. discussed above teach the cover ring to be ceramic. (See Steger et al. discussed above)

The motivation for constructing the cover ring including the cylindrical outer flange of ceramic is that it allows for mitigating the upward distortion of the plasma sheath boundary at the edge of the wafer. (See Steger et al. discussed above)

Cathey et al. is discussed above and teach the features of the waste ring. (See Cathey et al. discussed above)

The motivation for utilizing a waste ring is that it allows for reducing the effects of polymer deposition increasing the time between service intervals. (See Cathey et al. discussed above)

Drage is discussed above and teach the ridge of the waste ring. (See Drage discussed above)

The motivation for utilizing a waste ring with a ridge and extending under the substrate is that it allows for better control of the plasma. (See Drage discussed above)

Hower et al. is discussed above and teach the features of the rest buttons. (See Hower et al. discussed above)

The motivation for utilizing ceramic rest buttons is that it allows decoupling of the wafer from the susceptor. (See Hower et al. discussed above)

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Tepman et al. by utilizing a ceramic cover ring


Art Unit: 1753

as taught by Steger et al., to have utilized particular features of the waste ring as taught by Cathey et al., to have utilized the ridge of the waste ring as taught by Drage and to have utilized the features of the rest buttons as taught by Hower et al. because it allows for mitigating the upward distortion of the plasma sheath boundary at the edge of the wafer, for reducing the effects of polymer deposition, for controlling the plasma, and for decoupling the wafer from the susceptor.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney G. McDonald whose telephone number is 571-272-1340. The examiner can normally be reached on M- Th with Every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Rodney G. McDonald  
Primary Examiner  
Art Unit 1753

RM  
April 10, 2006